V. SUMMARY OF CLAIMED SUBJECT MATTER

The invention of claim 20 is a protecting element integrated in a substrate of a device so that the device is protected from inadvertent application of electrostatic energy. The basic structure of the protecting element is shown in FIGS. 1, 2A and 4A and described at page 4, line 9 - page 6, line 1, of the specification. A first high concentration impurity region 201 is formed in an insulating region 203 of a substrate 101 and connected to a first terminal GP of MESFET 100 formed in the substrate 101. A second high concentration impurity region 202 is formed in the insulating region 203 and connected to a second terminal SP or DP of MESFET 100. See FIG. 4A. The first and second high concentration impurity regions 201 and 202 face each other with a portion of the insulating region 203 being disposed between them, as shown in FIG. 2A.

Discharging of electrostatic energy applied between the first and second terminals is shown in FIGS. 12 and 16B and described at page 20, lines 3-29, and page 20, lines 21-27, of the specification. The width $\alpha 1$ of the first high concentration impurity region 201 is configured so that upon the discharging a current path I2 is formed in the insulating region 203 from the outer side surface of the first high concentration impurity region 201 to the second high concentration impurity region 202, in addition to the current path I1 that is formed between the inner side surfaces of the first and second high concentration impurity regions 201 and 202. The outer side surface of the first high concentration impurity region 201 is opposite from the inner side surface OS of the first high concentration impurity region 201 that faces that portion of the insulating region 203. The inner side surface OS of the first high concentration impurity region 201 overlaps at least partially with the inner side surface OS of the second high concentration impurity region 202 so that that portion of the insulating region 203 is disposed between the overlapping inner side surfaces OS. This overlapping of the inner side surfaces OS of the

first and second high concentration impurity regions 201 and 202 is shown in FIGS. 1, 2A, 4A, 12 and 16B, for example.

The invention of claim 39 is a protecting element and generally described at page 4, line 9 - page 6, line 1, and page 28, line 26 - page 30, line 9, and in FIGS. 1, 2A, 4A, 8A, 19C and 21B of the application. The protecting element includes a first high concentration impurity region 201 formed in an insulating region 203 and a second high concentration impurity region 202 formed in the insulating region 203. The first high concentration impurity region 201 is connected to a first terminal of an element comprising a PN junction or a Schottky junction, BP in the bipolar transistor shown in FIG. 8A or GP in the MESFET shown in FIG. 4A. The second high concentration impurity region 202 is connected to a second terminal of the element, EP or CP in FIG. 8A, or SP or DP in FIG. 4A. The first and second high concentration impurity regions 201 and 202 in the insulating region 203 are positioned so that an electrostatic energy applied between the first and second terminals BP, EP, CP, GP, SP and DP is at least partially discharged by a flow of electric current I2 in the insulating region 203 between the first and second high concentration impurity regions 201 and 202. See FIG. 19C. The distance β in the direction of the flow of electric current I2 between the first high concentration impurity region 201 and the edge of the insulating region 203 closest to the first high concentration impurity region 201 is 10 μm or larger. See FIGS. 19C and 21B.

The invention of claim 40 is also a protecting element and generally described at page 4, line 9 - page 6, line 1, and page 28, line 26 - page 30, line 9, and in FIGS. 1, 2A, 9A, 9B, 19C and FIG. 21B of the application. The protecting element includes a first high concentration impurity region 201 formed in an insulating region 203 and a second high concentration impurity region 202 formed in the insulating region 203. The first high concentration impurity region 201 is connected to a first electrode 404 of a capacitor 400, the second high concentration impurity region 202 is connected to a second

electrode 403 of the capacitor 400. See FIGS. 9A and 9B. The first and second high concentration impurity regions 201 and 202 in the insulating region 203 are positioned so that an electrostatic energy applied between the first and second terminals 403 and 404 is at least partially discharged by a flow of electric current I2 in the insulating region 203 between the first and second high concentration impurity regions 201 and 202. See FIG. 19C. The distance β in the direction of the flow of electric current I2 between the first high concentration impurity region 201 and the edge of the insulating region 203 closest to the first high concentration impurity region 201 is 10 μm or larger. See FIGS. 19C and 21B.

The invention of claim 41 is a protecting element and generally described at page 4, line 9 - page 6, line 1, and page 30, line 25 - page 32, line 2, and in FIGS. 1, 2A, 4A, 8A and 23A of the application. The protecting element includes a first high concentration impurity region 201 formed in an insulating region 203 and a second high concentration impurity region 202 formed in the insulating region 203. The first high concentration impurity region 201 is connected to a first terminal of an element comprising a PN junction or a Schottky junction, BP in the bipolar transistor shown in FIG. 8A or GP in the MESFET shown in FIG. 4A. The second high concentration impurity region 202 is connected to a second terminal of the element, EP or CP in FIG. 8A, or SP or DP in FIG. 4A. The first and second high concentration impurity regions 201 and 202 in the insulating region 203 are positioned so that an electrostatic energy applied between the first and second terminals BP, EP, CP, GP, SP and DP is at least partially discharged by a flow of electric current I3 in the insulating region 203 between the first and second high concentration impurity regions 201 and 202. See FIG. 23A. The distance γ in the direction normal to the flow of electric current I2 between the first high concentration impurity region 201 and the edge of the insulating region 203 closest to the first high concentration impurity region 201 is 10 μm or larger. See FIG. 23A.

The invention of claim 42 is also a protecting element and generally described at page 4, line 9 - page 6, line 1, and page 30, line 25 - page 32, line 2, and in FIGS. 1, 2A, 9A, 9B and 23A of the application. The protecting element includes a first high concentration impurity region 201 formed in an insulating region 203 and a second high concentration impurity region 202 formed in the insulating region 203. The first high concentration impurity region 201 is connected to a first electrode 404 of a capacitor 400, the second high concentration impurity region 202 is connected to a second electrode 403 of the capacitor 400. See FIGS. 9A and 9B. The first and second high concentration impurity regions 201 and 202 in the insulating region 203 are positioned so that an electrostatic energy applied between the first and second terminals 403 and 404 is at least partially discharged by a flow of electric current I3 in the insulating region 203 between the first and second high concentration impurity regions 201 and 202. See FIG. 23A. The distance γ in the direction normal to the flow of electric current I2 between the first high concentration impurity region 201 and the edge of the insulating region 203 closest to the first high concentration impurity region 201 is 10 μm or larger. See FIG. 23A.